

## **Predicting risks of island extinctions due to sea level rise: model-based tools to mitigate terrestrial habitat losses in the Northwestern Hawaiian Islands**

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**Summary:** Scenarios of projected global climate change predict that sea level rise may inundate coastal and low elevation Pacific islands. The Northwestern Hawaiian Islands include 300,000 sq. km of ocean waters and 10 sub-tropical islands and atolls of high conservation value. Designated as Papahānaumokuākea Marine National Monument, the islands provide habitat for the largest and most important assemblages of tropical seabirds in the world (14 million birds of 22 species) and 11 endangered species of terrestrial birds and plants. Existing models of projected terrestrial habitat loss vary greatly between islands, but even small increases in sea level may result in loss of critical habitat and increase risk of extinctions of species restricted to low lying atolls. Thus, current conservation strategies to address climate change are based primarily on building interconnected systems of corridors and reserves. These strategies may be inadequate for many island species that are entirely blocked from shifting their geographic ranges by anthropogenic barriers to dispersal, such as loss of habitat, urbanization, introduced predators (absent from the remote low lying islands), or by behavioral and geographic constraints on dispersal. These island ecosystems require downsized spatial and temporal models to identify, assess, and manage risks to unique biological resources. This project will map the current distribution of key species, and identify the areas and species most vulnerable to climate-related sea level rise, so that resource managers can plan for management scenarios such restorations or as the intentional transport of species to prevent species extinction (i.e. “assisted migration” or translocation).

Partners in this study include a broad range of representatives from the State of Hawaii, Department of Defense, US Coast Guard, US Fish and Wildlife Service, Environmental Protection Agency, National Park Service, National Oceanic and Atmospheric Administration, and the University of Hawaii, Hilo.

